CLAIMS

What is claimed is:

1. A method of detecting a predisposition to cancer in an animal, said method comprising:

(i) providing a biological sample from said animal;

(ii) detecting the level of a gene of Figure 1 or Figure 2 within said biological sample; and

(iii) comparing said level of said gene with a level of said gene in a control sample taken from a normal, cancer-free tissue;

wherein an increased level of the gene of Figure 1 or a decreased level of the gene of Figure 2 in said biological sample compared to the level of said gene in said control sample indicates a predisposition to cancer in said animal.

2. The method of claim 1, wherein said level of said gene is detected by determining the copy number of genes in the cells of said biological sample.

3. The method of claim 2, wherein said copy number is measured using Comparative Genomic Hybridization (CGH).

4. The method of claim 1, wherein said copy number is determined by hybridization to an array of nucleic acid probes.

5. The method of claim 3, wherein said Comparative Genomic Hybridization is performed on an array.

6 The method of claim 1, wherein said level of said gene is detected by measuring the level of said gene mRNA in said biological sample, wherein an increased level of said gene of Figure 1 or decreased level of said gene of Figure 2 RNA in said sample compared to RNA in said control sample indicates a predisposition to cancer.

7. The method of claim 6, wherein said level of mRNA is measured in said biological sample and said control sample at the same time.

8. The method of claim 6, wherein said level of mRNA is measured by hybridization to one or more probes on an array.

9. The method of claim 1, wherein said level of a gene of Figure 1 or Figure 2 is detected by measuring the level of the gene product of said gene in said biological sample, wherein an increased level of said product of the gene of Figure 1 or a decreased level of said product of the gene of Figure 2 in said sample as compared to said gene product in said control sample indicates a predisposition to cancer.

10. The method of claim 9, wherein the level of said gene product is measured in the biological sample and the control sample at the same time.

11. The method of claim 1, wherein said animal is a mammal selected from the group consisting of humans, non-human primates, canines, felines, murines, bovines, equines, porcines, and lagomorphs.

12. The method of claim 1, wherein said biological sample is selected from the group consisting of excised tissue, whole blood, serum, plasma, buccal scrape, saliva, cerebrospinal fluid, and urine.

13. The method of claim 1, wherein the difference between said increased level of the gene of Figure 1 or said decreased level of the gene of Figure 2 in said biological sample and the level of said gene in said control sample is a statistically significant difference.

14. The method of claim 1, wherein said increased level of the gene of Figure 1 or decreased level of the gene of Figure 2 in said biological sample is at least about 2-fold greater or lesser than the level of said gene in said control sample.

15. The method of claim 1, wherein said increased level of the gene of Figure 1 or decreased level of the gene of Figure 2 in said biological sample is at least about 4-fold greater or lesser than the level of said gene in said control sample.

16. A method of estimating the survival expectancy of an animal, said method comprising:

(i) providing a biological sample from said animal;

(ii) detecting the level of a gene of Figure 1 or Figure 2 within said biological sample; and

(iii) comparing said level of said gene with a level of said gene in a control sample taken from a normal, cancer-free tissue;

wherein an increased level of the gene of Figure 1 or a decreased level of the gene of Figure 2 in said biological sample compared to the level of said gene in said control sample indicates a reduced survival expectancy in said animal compared to an animal with cancer that has a normal level of said gene.

17. The method of claim 16, wherein said level of said gene is detected by determining the copy number of said genes in the cells of said animal.

18. The method of claim 17, wherein said copy number is determined by hybridization to an array of nucleic acid probes.

19. The method of claim 17, wherein said copy number is measured using Comparative Genomic Hybridization.

20. The method of claim 19, wherein said Comparative Genomic Hybridization is performed on an array.

21. The method of claim 16, wherein said level of said gene is detected by measuring the level of said gene mRNA in said biological sample, wherein an increased level of RNA of the gene of Figure 1 or decreased level of the RNA of the gene of Figure 2 in said sample as compared to RNA in said control sample indicates a reduced survival expectancy.

22. The method of claim 1, wherein said level of mRNA is measured in said biological sample and said control sample at the same time.

23. The method of claim 16, wherein said level of said gene is detected by measuring the level of the gene product of said gene in said biological sample, wherein an increased level of the gene product of a gene of Figure 1 or decreased level of the gene product of a gene of Figure 2 in said sample as compared to said gene said control sample indicates a reduced survival expectancy.

24. The method of claim 16, wherein said animal is a mammal selected from the group consisting of humans, non-human primates, canines, felines, murines, bovines, equines, porcines, and lagomorphs.

25. The method of claim 16, wherein said biological sample is selected from the group consisting of excised tissue, whole blood, serum, plasma, buccal scrape, saliva, cerebrospinal fluid, and urine.

26. The method of claim 16, wherein the difference between said level of said gene in said biological sample and the level of said gene in said control sample is a statistically significant difference.

27. The method of claim 16, wherein said increased level of said gene of Figure 1 or said decreased level of said gene of Figure 2 in said biological sample is at least about 2-fold different than the level of said gene in said control sample.

28. The method of claim 16, wherein said increased level of said gene of Figure 1 or said decreased level of said gene of Figure 2 in said biological sample is at least about 4-fold different than the level of said gene in said control sample.
.

29. A method of treating cancer in an animal, said method comprising:
(i) providing a biological sample from said animal;
(ii) detecting the level of a gene of Figure 1 or Figure 2 within said biological sample;
(iii) comparing said level of said gene with a level of said gene in a control sample taken from a normal, cancer-free tissue; and
(iv) selecting and performing a cancer therapy in those animals having an increased level of said gene of Figure 1 or a decreased level of said gene of Figure 2 compared to the level of said gene in said control sample.

11. The method of claim 29, wherein said cancer therapy is selected from the group consisting of chemotherapy, radiation therapy, surgery, antihormone therapy, and immunotherapy.

31. The method of claim 29, wherein said cancer therapy is an adjuvant cancer therapy.

32. The method of claim 29, wherein said level of said gene is detected by determining the copy number of genes in the cells of said animal.

33. The method of claim 32, wherein said copy number of genes is determined by hybridization to an array of nucleic acid probes.

34. The method of claim 32, wherein said copy number of said genes is measured using Comparative Genomic Hybridization (CGH).

35. The method of claim 34, wherein said Comparative Genomic Hybridization is performed on an array.

36. The method of claim 29, wherein said level of said gene is detected by measuring the levels of said gene mRNA in said biological sample, wherein an increased level of said gene of Figure 1 or a decreased level of siad gene of Figure 2 RNA in said sample as compared to said gene RNA in said control sample indicates the need for an adjuvant cancer therapy.

37. The method of claim 36, wherein said level of said gene RNA is measured in said biological sample and said control sample at the same time.

38. The method of claim 29, wherein said level of said gene is detected by measuring the level of the product of said gene in said biological sample, wherein an increased level of the product of said gene of Figure 1 or a decreased level of the product of said gene of Figure 2 in said sample as compared to said gene product in said control sample indicates the need for an adjuvant cancer therapy.

39. The method of claim 29, wherein said animal is a mammal selected from the group consisting of humans, non-human primates, canines, felines, murines, bovines, equines, porcines, and lagomorphs.

40. The method of claim 29, wherein said biological sample is selected from the group consisting of excised tissue, whole blood, serum, plasma, cerebrospinal fluid, buccal scrape, saliva, and urine.

41. The method of claim 29, wherein the difference between said increased level of said gene in said biological sample and the level of said gene in said control sample is a statistically significant difference.

42. The method of claim 29, wherein said increased level of said gene in said biological sample is at least about 2-fold different than the level of said gene in said control sample.

43. The method of claim 29, wherein said level of said gene in said biological sample is at least about 4-fold different than the level of said gene in said control sample.

44. A method of screening a test agent for the ability to inhibit proliferation of a cell expressing a gene of Figure 1 or Figure 2, said method comprising:

(i) contacting said cell with said test agent; and

(ii) detecting the level of said gene activity;

wherein a decreased level of activity of a gene of Figure 1 or an increased level of activity of a gene of Figure 2 as compared to the level of gene activity in a cell not contacted with said agent indicates that said agent inhibits proliferation of said cell.

45. The method of claim 44, wherein said detecting comprises detecting the level of a product of said gene wherein a decreased level of said product of said gene of Figure 1 or an increased level of said product of said gene of Figure 2 in said cell as compared to the gene product level in a cell not contacted with said agent sample indicates that said agent inhibits proliferation of said cell.

46. The method of claim 44, wherein said cell is a tumor cell.

47. The method of claim 44, wherein said cell is a hyperproliferative cell.

48. The method of claim 44, wherein the difference between said gene activity and the level of said gene activity activity in a cell not contacted with said agent is a statistically significant difference.

49. The method of claim 44, wherein said level of gene activity is at least about 2-fold differrent than the level of gene activity in a cell not contacted with said agent.

50. The method of claim 44, wherein said level of said gene activity is at least about 4-fold different than the level of said gene activity in a cell not contacted with said agent.

51 A method of decreasing the proliferation of a cell with an elevated level of a gene of Figure 1, said method comprising reducing the level of said gene activity in said cell using an inhibitor of said gene.

52. The method of claim 51, wherein said cell is a hyperproliferative cell.

53. The method of claim 51, wherein said cell is a metastatic cell.

54. The method of claim 51, wherein said inhibitor is selected from the group consisting of antisense oligonucleotides, ribozymes, and repressors of said gene.